



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,835	07/23/2001	Hiroyuki Tanaka	N36-134375M/TH	2206

30743 7590 04/17/2003

WHITHAM, CURTIS & CHRISTOFFERSON, P.C.  
11491 SUNSET HILLS ROAD  
SUITE 340  
RESTON, VA 20190

EXAMINER

VALENCIA, DANIEL E

ART UNIT PAPER NUMBER

2874

DATE MAILED: 04/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/909,835

Applicant(s)

TANAKA ET AL.

Examiner

Daniel E Valencia

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1, 3-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 1/22/03 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

Applicant's communication filed on January 22 and March 25 of 2003 has been carefully studied by the Examiner. Some of the arguments regarding the prior art (not including Meadowcroft) advanced therein, considered together with the amendments made to the claims, are persuasive and some of the rejections based upon prior art made of record in the previous Office Action are withdrawn. In view of further search and consideration, however, and the consequent discovery of previously uncited prior art document; a new rejection is applied to certain of the pending claims. This action is **not** made final.

### ***Claim Objections***

Claim 14 is objected to because of the following informalities: The claim is a duplicate of claim 11. Examiner believes that claim 14 should depend on independent claim 10. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2874

Claims 1, 3, 4, 6, 7, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Cook U.S. Patent No. 3,950,075 (newly cited). Refer to the appropriate drawings or parts of the specification. Cook discloses a light source for an optical waveguide bundle with all the limitations of the abovementioned claims. Regarding claim 1, Cook discloses an optical module (figure 1 and 2) comprising: an optical semiconductor element (18) sealed (12) with a cap (12 and 26) having an upper surface formed with a window (30); at least one optical part confronted with the window; a housing (22) holding the optical part (16) therein and having an opened end face wherein an outer dimension of the opened end face of the housing is equal to or smaller than an outer dimension of the upper surface of the cap (width of 26); and a connecting layer directly connecting the upper surface of the cap to the opened end face of the housing (col. 3, lines 20-25). Cook's disclosure also shows that the optical semiconductor element has a stem portion opposite from the upper surface of the cap, an outer dimension of the opened end face of the housing is equal to or smaller than the outer dimension of the stem portion (bottom of 26 and 28), wherein the stem portion is distanced from the opened end face of the housing, as described in instant claims 3 and 4. As to claim 6, Cook discloses that the housing has a receptacle part adapted to receive a mating optical plug (34). Cook's disclosure also shows that the module has a casing (24), which at least partly covers the cap and the housing; and which extend across the connecting layer as explained in claim 7. With reference to claim 9, Cook discloses an optical module in which an optical semiconductor element of the cap sealing type is mounted on a housing to be aligned with an optical axis of at least one

Art Unit: 2874

optical part contained in the housing, wherein: an upper surface of the cap of said optical semiconductor element is bonded (by 30) to an end face of said housing.

Regarding claim 10 (as applied above), Cook discloses an optical module in which an optical semiconductor element of the cap sealing type is mounted on a housing to be aligned with an optical axis of a lens contained on the housing adapted to fittingly receive and hold a ferrule of an optical plug of an mating connecting member, wherein: an upper surface of a cap of said optical semiconductor element is bonded to an end face of said housing.

Claims 1, 3, 4, 6, 7, 9, 10, 11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi U.S. Patent No. 5,631,992 (newly cited). Refer to the appropriate drawings or parts of the specification. Takahashi discloses an optical fiber LED assembly with all the limitations of the abovementioned claims. Regarding claim 1, Takahashi discloses an optical module (figure 1) comprising: an optical semiconductor element (2) sealed with a cap (3) having an upper surface formed with a window (not labeled); at least one optical part (9) confronted with the window; a housing (10) holding the optical part therein and having an opened end face (toward the cap side) wherein an outer dimension of the opened end face of the housing is equal to or smaller than an outer dimension of the upper surface of the cap; and a connecting layer (18) directly connecting the upper surface of the cap to the opened end face of the housing. Takahashi's disclosure shows that the semiconductor element has a stem portion (6) opposite from the upper surface of the cap, and the outer dimension of the opened end

Art Unit: 2874

face of the housing is equal to or smaller than an outer dimension of the stem portion, wherein the stem portion is distanced from the opened end face, as explained in instant claims 3 and 4. As to claim 6, Takahashi discloses that the housing has a receptacle part adapted to receive a mating optical plug (11). Takahashi's disclosure also shows that the module has a casing (8), which at least partly covers the cap and the housing; and which extend across the connecting layer as explained in claim 7. With reference to claim 9, Takahashi discloses an optical module in which an optical semiconductor element (2) of the cap sealing (3) type is mounted on (10) a housing to be aligned with an optical axis of at least one optical part (9) contained in the housing, wherein: an upper surface of the cap (not labeled) of said optical semiconductor element is bonded to an end face of said housing (by 18). Regarding claim 10, Cook discloses an optical module in which an optical semiconductor element (2) of the cap sealing type (3) is mounted on a housing (9) to be aligned with an optical axis of a lens (9) contained on the housing adapted to fittingly receive and hold a ferrule (11) of an optical plug of an mating connecting member, wherein: an upper surface of a cap of said optical semiconductor element is bonded to an end face of said housing. Takahashi further discloses that a side surface of the cap is partly covered with a casing (8) and a clearance therebetween is sealed with resin (19), as mentioned in claims 11 and 14.

Claims 1, 3, 4, 6-9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Meadowcroft U.S. Patent No. 5,522,001. Refer to the appropriate drawings or parts of the specification. . Regarding claim 1, Meadowcroft discloses an

Art Unit: 2874

optical module (fig 1, 3, and 4) comprising: an optical semiconductor element (48) sealed with a cap (47 and 46, collectively) having an upper surface formed with a window (not labeled); at least one optical part (fig 4, not labeled) confronted with the window; a housing (45) holding the optical part therein and having an opened end face wherein an outer dimension of the opened end face of the housing is equal to or smaller than an outer dimension of the upper surface of the cap; and a connecting layer (43) directly connecting the upper surface of the cap (47 and 46) to the opened end face of the housing. With reference to claim 3, Meadowcroft discloses that the optical semiconductor element has a stem portion (49) opposite from the upper surface of the cap, and an outer dimension of the opened end face of the housing is equal to or smaller than an outer dimension of the stem portion. Meadowcroft also discloses that the optical semiconductor element has a stem portion opposite from the upper surface of the cap, and the stem portion is distanced from the opened end face of the housing (fig 3 and 4), as explained in instant claim 4. Regarding claim 6, Meadowcroft discloses that the housing has a receptacle part adapted to receive a mating optical plug (col. 5, lines 40-60). Meadowcroft further discloses that the optical module includes a casing (42), which at least partly covers the cap and the housing; and which extends across the connecting layer, as described in instant claim 7. Referring to claims 8 and 11, Meadowcroft discloses a sealing layer (44) filled in a clearance between the casing, and the connecting layer, the sealing layer being formed by a resin curable thermally (col. 5, lines 25-30). Meadowcroft further discloses an optical module in which an optical semiconductor element of the cap sealing type is mounted on a housing to be aligned

Art Unit: 2874

within an optical axis of at least one optical part contained within the housing (claim 1), wherein: an upper surface of a cap of said optical semiconductor element is bonded to an end face of said housing, as explained in instant claim 9. Applicant asserts that Meadowcroft does not show an "upper surface of a cap bonded to an end face of said housing" in a direct connection due to the use of an intermediate member. However, the claim language is sufficiently broad to consider element 46 and 47, collectively, forming the claimed cap member in direct connection with the housing.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi. Refer to the appropriate drawings or parts of the specification. Takahashi discloses an optical module with all the limitations of claims 1, 3, 4, 6, 7, 9, 10, 11, and 14; however, the reference fails to explicitly state the type of resins used for sealing the module.

On the other hand, it is well known in the art of fiber optics, more specifically fiber optic device modules, to use different types of UV curing and thermosetting resins and adhesives. One of ordinary skill in the art would recognize that the well-known advantages of these adhesives and sealants include: being able to set two components



Art Unit: 2874

into alignment before curing/setting the resin (or adhesive). These modifications of the prior art would have been obvious to one of ordinary skill in the art at the time of invention; and therefore do not further limit the scope of the claimed invention.

Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of Benzoni U.S. Patent No. 5,337,398. Refer to the appropriate drawings or parts of the specification. Takahashi discloses an optical module with all the limitations of claims 1, 3, 4, 6, 7, 9, 10, 11, and 14; however, the reference fails to explicitly state that a plurality of the modules can be used in a single casing.

On the other hand, Benzoni teaches the limitations that the Takahashi reference lacks. Specifically regarding parts of claims 13 and 15, Benzoni discloses a plurality of optical modules (fig 10 and 12) arrayed in juxtaposition and covered with a single common casing (60), each of the optical modules including an optical semiconductor element of a cap (fig 5 and 7) sealing type mounted on a housing to be aligned with an optical axis of at least one optical lens (42) contained in the housing, wherein a resin seals a clearance between each of said optical modules. Benzoni teaches this advantageous feature of being able to couple more than one semiconductor component to optical parts disclosed in the respective housings, in order to be able to communicate two signals in parallel. Both Benzoni and Takahashi teach devices for coupling semiconductor elements in alignment with an optical lens for use in a connector. Furthermore, one of ordinary skill in the art would recognize that the teachings of

Art Unit: 2874

Benzoni should be combined with the Takahashi device; therefore, making the claimed invention obvious at the time of invention.

### ***Conclusion***

Applicant's arguments filed January 22, 2003, regarding anticipation by Meadowcroft, have been fully considered but they are not persuasive. The arguments have been addressed in the above rejection.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Okochi U.S. Patent No. 5,533,159 discloses a module for optical fiber communication, which is especially relevant to claims 1, 3, 4, 6-9, 10, 11, and 14.

Ohyama U.S. Patent No. 4,737,008 discloses an optical transmitting and/or receiving module relevant to claims 13 and 15.

Tanisawa U.S. Patent No. 5,278,929 discloses an optical module and method for fabrication relevant to claims 5, 12, 13, and 15.

Musk U.S. Patent No. Re. 34,790 discloses optical components having a sealed cap with an optical part confronting the window of the upper surface and curable adhesive.

Tonai U.S. Patent No. 5,452,389 discloses a semiconductor element module for aligning a lens with a sealed cap semiconductor element.

Yamagata U.S. Patent Application Publication No. 2003/0012496 discloses the coupling of a lens and semiconductor laser module especially relevant to claims 1, 3, 4, 9, and 10.

Kikuchi U.S. Patent No. 5,546,490 discloses an optical fiber connector especially relevant to claim 9.

Kunikane U.S. Patent No. 5,546,212 discloses an optical module for two-way transmission, especially relevant to claims 1, 3, 4, 6, 9, and 10

Cohen U.S. Patent No. 6,302,596 discloses optoelectronic transceivers, especially relevant to claims 5, 12, 13, and 15.

Tojo U.S. Patent No. 5,537,503 discloses an optical semiconductor module and method for aligning an optical part to a cap sealed semiconductor element.

Takahashi U.S. Patent No. 5,588,081 discloses a light-coupling device to a light source into a fiber, wherein the device aligns the optical part with the device using a housing for holding a lens.

Mugiya U.S. Patent No. 5,841,924 discloses an optical apparatus having a ferrule holder, a lens holder and an optical semiconductor device package holder, especially relevant to claims 1, 3, 4, 6-9, and 10.

Asakura U.S. Patent No. 6,120,191 discloses a laser diode module including a lens holder aligned with the cap sealed diode.

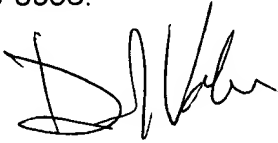
Wu U.S. Patent No. 6,113,284 discloses an optical fiber light source assembly and manufacturing method, wherein the device uses coupled a cap sealed semiconductor device to a lens disposed in a housing.

Art Unit: 2874

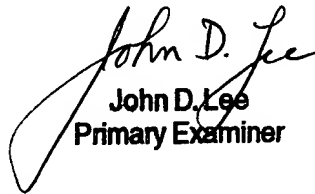
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel E Valencia whose telephone number is (703)-305-4399. The examiner can normally be reached on Monday-Friday 9:30-6:00.

The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7724 for regular communications and (703)-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.



dv  
April 10, 2003



John D. Lee  
Primary Examiner